

IN THE CLAIMS

Please amend claims 1, and 8-44. Claims 45 and 46 have been withdrawn from consideration. Thus, claims 1-44 are pending upon entry of this amendment.

1. (Currently Amended) A method for detecting a non-nucleic acid compound of interest in a sample comprising the steps of:

- a) providing a binding construct comprising a non-nucleic acid recognition portion which recognizes and binds said non-nucleic acid compound of interest without capture on a solid support, and a nucleic acid portion;
- b) mixing said binding construct with said sample in a mixture to form construct-compound complexes;
- c) providing one or more surfaces, wherein said surface bears one or more accessible non-nucleic acid binding targets capable of recognizing and binding to said non-nucleic acid recognition portion of said binding construct;
- d) introducing said one or more surfaces to said mixture of said binding construct and said sample in order for said one or more surfaces to form construct-surface complexes with any unbound binding constructs;
- e) separating said construct-surface complexes from said mixture leaving behind said construct-compound complexes; and
- f) detecting the presence or absence of said nucleic acid portion of said binding construct; wherein the presence of said nucleic acid portion of said binding construct indicates the presence of said non-nucleic acid compound of interest in said sample.

2. The method of claim 1, wherein said one or more surfaces is selected from the group consisting of: particles, powders, beads, planar surfaces, non-planar surfaces, a tube, a well, non-porous films, non-porous membranes, porous films, porous membranes, fibers, fillers, meshes, grids, filters, matrices, gels, and combinations thereof.

3. The method of claim 1, wherein said one or more surfaces comprises particles.
4. The method of claim 3, wherein said particles comprise magnetic particles.
5. The method of claim 4, wherein said step (e) comprises separating said construct-surface complexes out of said mixture by means of a magnet.
6. The method of claim 1, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.
7. The method of claim 1, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

[[7]] 8. (Currently Amended) The method of claim 7, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

[[8]] 9. (Currently Amended) The method of claim 5, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

[[9]] 10. (Currently Amended) The method of claim 5, wherein, in step (f), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

[[10]] 11. (Currently Amended) The method of claim [[9]] 10, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

[[11]] 12. (Currently Amended) The method of claim 1, wherein said non-nucleic acid recognition portion comprises a receptor.

[[12]] 13. (Currently Amended) The method of claim 1, wherein said non-nucleic acid recognition portion comprises an antigen.

[[13]] 14. (Currently Amended) The method of claim 1, wherein said non-nucleic acid recognition portion comprises an antibody or an antibody fragment.

[[14]] 15. (Currently Amended) The method of claim 1, wherein said non-nucleic acid recognition portion comprises a single chain antibody variable region fragment.

[[15]] 16. (Currently Amended) The method of claim 1, wherein said non-nucleic acid recognition portion comprises a Fab fragment.

[[16]] 17. (Currently Amended) The method of claim [[15]] 16, wherein said Fab fragment is attached to said nucleic acid portion through the free sulphydryl of the Fab fragment.

[[17]] 18. (Currently Amended) The method of claim [[12]] 13 wherein said non-nucleic acid compound of interest comprises an antibody or antibody fragment, said non-nucleic acid recognition portion of said binding construct comprises an antigen that is recognized by said non-nucleic acid compound of interest, and said accessible non-nucleic acid binding targets comprise an antibody or antibody fragment that is capable of recognizing and binding to said non-nucleic acid recognition portion of said binding construct.

[[18]] 19. (Currently Amended) The method of claim 1, wherein said nucleic acid portion comprises DNA.

[[19]] 20. (Currently Amended) The method of claim 1, wherein said nucleic acid portion comprises RNA.

[[20]] 21. (Currently Amended) The method of claim 1, wherein said nucleic acid portion comprises a nucleic sequence that does not include a sequence that is expected to be found in the sample.

[[21]] 22. (Currently Amended) The method of claim 1, wherein said step (a) comprises providing two or more different types of binding constructs, wherein each of said two or more different binding constructs has a different non-nucleic acid recognition portion and a different nucleic acid portion.

[[22]] 23. (Currently Amended) A method for increasing the sensitivity of solution-phase detection of a non-nucleic acid compound of interest, comprising the steps of:

- a) providing a sample suspected of containing said non-nucleic acid compound of interest;
- b) providing a binding construct comprising:
  - i) a non-nucleic acid recognition portion capable of binding said non-nucleic acid compound of interest without capture on a solid support, and
  - ii) a nucleic acid portion
- c) contacting said sample with said binding construct for a period of time sufficient to permit said non-nucleic acid recognition portion to bind said non-nucleic acid compound of interest present in said sample, thereby forming construct-compound complexes in solution;
- d) providing one or more surface, wherein said one or more surfaces bears one or more accessible non-nucleic acid binding target capable of binding to said non-nucleic acid recognition portion;
- e) contacting said one or more surfaces with said solution for a period of time sufficient for said one or more accessible non-nucleic acid binding target to bind said non-nucleic acid recognition portion of any binding construct not bound to said non-nucleic acid compound of interest, thereby forming construct-surface complexes;
- f) separating said construct-surface complexes from said solution, leaving said construct-compound complexes in said solution; and
- g) detecting the presence or absence of said nucleic acid portion of said binding construct in said solution,  
wherein said separation of said construct-surface complexes from said solution results in a separation of substantially all binding constructs not bound to a non-nucleic acid compound of interest and in an increased sensitivity of detection of said non-nucleic acid compound of interest, and  
wherein the presence of said nucleic acid portion of said binding construct

indicates the presence of said non-nucleic acid compound of interest in said sample.

[[23]] 24. (Currently Amended) The method of claim [[22]] 23, wherein said one or more surfaces is selected from the group consisting of: particles, powders, beads, planar surfaces, non-planar surfaces, a tube, a well, non-porous films, non-porous membranes, porous films, porous membranes, fibers, fillers, meshes, grids, filters, matrices, gels, and combinations thereof.

[[24]] 25. (Currently Amended) The method of claim [[22]] 23, wherein said one or more surfaces comprises particles.

[[25]] 26. (Currently Amended) The method of claim [[24]] 25, wherein said particles comprise magnetic particles.

[[26]] 27. (Currently Amended) The method of claim [[25]] 26, wherein said step (f) comprises separating substantially all said construct-surface complexes from said solution by means of a magnet.

[[27]] 28. (Currently Amended) The method of claim [[22]] 23, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

[[28]] 29. (Currently Amended) The method of claim [[22]] 23, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

[[29]] 30. (Currently Amended) The method of claim [[28]] 29, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

[[30]] 31. (Currently Amended) The method of claim [[26]] 27, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion, hybridization of said nucleic acid portion, enzymatic amplification, detection of a label, or a combination thereof.

[[31]] 32. (Currently Amended) The method of claim [[26]] 27, wherein, in step (g), said detecting the presence or absence of said nucleic acid portion of said binding construct comprises amplification of said nucleic acid portion.

[[32]] 33. (Currently Amended) The method of claim [[31]] 32, wherein said amplification of said nucleic acid portion comprises a polymerase chain reaction.

[[33]] 34. (Currently Amended) The method of claim [[22]] 23, wherein said non-nucleic acid recognition portion comprises a receptor.

[[34]] 35. (Currently Amended) The method of claim [[22]] 23, wherein said non-nucleic acid recognition portion comprises an antigen.

[[35]] 36. (Currently Amended) The method of claim [[22]] 23, wherein said non-nucleic acid recognition portion comprises an antibody or antibody fragment.

[[36]] 37. (Currently Amended) The method of claim [[22]] 23, wherein said non-nucleic acid recognition portion comprises a single chain antibody variable region fragment.

[[37]] 38. (Currently Amended) The method of claim 22, wherein said non-nucleic acid recognition portion comprises a Fab fragment.

[[38]] 39. (Currently Amended) The method of claim [[37]] 38, wherein said Fab fragment is attached to said nucleic acid portion through the free sulphydryl of the Fab fragment.

[[39]] 40. (Currently Amended) The method of claim [[34]] 35, wherein said non-nucleic acid compound of interest comprises an antibody or antibody fragment, said non-nucleic acid recognition portion of said binding construct comprises an antigen that is recognized by said non-nucleic acid compound of interest, and said non-nucleic acid accessible binding targets comprise an antibody or antibody fragment that is capable of recognizing and binding to said non-nucleic acid recognition portion of said binding construct.

[[38]] 41. (Currently Amended) The method of claim [[21]] 23, wherein said nucleic acid portion comprises DNA.

[[39]] 42. (Currently Amended) The method of claim [[21]] 23, wherein said nucleic acid portion comprises RNA.

[[40]] 43. (Currently Amended) The method of claim [[21]] 23, wherein said nucleic acid portion comprises a nucleic sequence that does not include a sequence that is expected to be found in the sample.

[[41]] 44. (Currently Amended) The method of claim [[21]] 23, wherein said step (b) comprises providing two or more different types of binding constructs, wherein each of said two or more different binding constructs has a different non-nucleic acid recognition portion and a different nucleic acid portion.

[[42]] 45. (Withdrawn)

[[43]] 46. (Withdrawn)